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SOURCE GOVT (State Standard) 3315-46, All-Union Committee on Standards,

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THE CLASSIFICATION OF HYDROTECHNICAL INSTALLATIONS
ACCORDING TO IMPORTANCE

This standard was introduced by the Ministry of Power Plants and confirmed by the All-Union Committee on Standards of the Council of Ministers on 25 October 1946, to be effective as of 1 January 1947.

1. The present standard is applied in regard to the classification, by importance, of newly constructed and reconstructed hydrotechnical installations: hydroelectric power plants, land development projects, and river transport facilities
2. The class of importance of a hydrotechnical installation must be considered in the planning of hydrotechnical installations for the determination of:
 - a. Permitted loads, coefficients of supplies, coefficients of stability of the installations and their parts;
 - b. Kind and type of materials used;
 - c. Maximum expenditures of water necessary for construction and operation of the installations;
 - d. Composition and quantity of surveying, research, and planning works;
 - e. Methods of accounting for the installations and their components.

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3. The assignment of a hydrotechnical installation to any class is done by a planning organization and is confirmed by an agency empowered to confirm such projects.

4. Hydrotechnical installations are divided into:

- a. Five grades, depending on productive effectiveness;
- b. Basic, secondary, and auxiliary installations, depending on significance;
- c. Permanent and temporary installations, depending on length of service, according to points 5 and 6 of the present standard;
- d. Five classes, according to importance: Class I, extremely important; Class II, of increased importance; Class III, of ordinary importance; Class IV, light duty; and Class V, extra light duty.

5. Basic and secondary installations whose length of service has not previously been limited or exceeds 5 years are permanent.

6. Temporary installations are basic and secondary installations whose length of service has been previously limited and does not exceed 5 years; also, all auxiliary installations are temporary.

7. Placing a hydrotechnical installation in any class is done in the following manner: upon determination of the grade, significance, and length of service of the installation, it is placed in a class in accordance with the table at the end of this report and points 8, 9 and 10 of the present standard.

8. If a hydrotechnical center is simultaneously a power, land development, and transport installation, the classes of the separate installations of the center are determined according to the corresponding branches of management (power, development, transport). The classes of installations of a center which concern the operation of the center as a whole are determined by the branch giving the highest classification.

9. Increasing the class of an installation by one class is permitted, as an exception, in the following cases:

- a. If an accident to a basic installation causes catastrophic consequences to populated places and enterprises located lower than the basic installation, or can cause considerable damage to the economy.
- b. If an accident to an auxiliary installation of the First or Second Grades can cause serious damage to a basic installation;
- c. In the planning of especially heavy dams and sluices operating under great pressure, and also of complex or of poorly designed basic installations of the Second or Third Grades.
- d. In the planning of basic and secondary installation in unfavorable geologic or hydrogeologic conditions -- for instance, in the presence of weak or chemically unstable ground, and in case of landslides.

10. Lowering basic permanent installations of the First, Second, and Third Grades by one class must be effected in the following cases:

- a. If the installation has relatively small dimensions, is under little pressure; or has simple structures placed on a fully secure base;

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b. If the installation operates with breaks whose lengths allow repairs to be made without interfering with the operation of the center.

11. Raising or lowering the class of an installation must be justified and must be confirmed in conformance with point 3 of the present standard.

Grades of Hydrotechnical Installations

First Grade

Hydroelectric Power Plant -- Installations of hydroelectric power plants with a capacity of more than 250,000 kilowatts and producing not less than one billion kilowatt-hours of electric power per year.

Land Development Projects -- Installations irrigating or draining an area of more than 250,000 hectares.

River Transport Facilities -- Locks and navigable canals on superwaterways.

Second Grade

Hydroelectric Power Plants -- Installations of hydroelectric power plants with a capacity of 25,000-250,000 kilowatts and producing not less than 100 million kilowatt-hours of electric power per year; also, installations of hydroelectric power plants with a large capacity and producing less than one billion kilowatt-hours of electric power per year.

Land Development Projects -- Installations which (1) irrigate or drain an area of 50,000-250,000 hectares; (2) supply water to an area of more than 500,000 hectares; (3) provide flood protection to an area of more than 250,000 hectares.

River Transport Facilities -- Locks and navigable canals on water routes of the First Grade.

Third Grade

Hydroelectric Power Plants -- Installations of hydroelectric power plants with a capacity of 1,000-25,000 kilowatts and producing not less than 4 million kilowatt-hours of electric power per year; also, installations of hydroelectric power plants with a large capacity and producing less than 100 million kilowatt-hours of electric power per year.

Land Development Projects -- Installations which (1) irrigate or drain an area of 20,000-50,000 hectares; (2) supply water to an area of 50,000-500,000 hectares; (3) provide flood protection to an area of 50,000-250,000 hectares.

River Transport Facilities: Locks and navigable canals on Second Grade water routes.

Fourth Grade

Hydroelectric Power Plants -- Installations of hydroelectric power plants with a capacity of 100-1,000 kilowatts; also, installations of plants with a greater capacity and producing less than 4 million kilowatt-hours of electric power per year.

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Land Development Projects -- Installations which (1) irrigate or drain an area of 5,000-20,000 hectares; (2) supply water to an area of 5,000-50,000 hectares; (3) provide flood protection to an area of 5,000-50,000 hectares.

River Transport Facilities -- Locks and navigable canals on First and Second Grade rivers used for local transportation.

Fifth Grade

Hydroelectric Power Plants -- Installations of hydroelectric power plants with a capacity of less than 100 kilowatts.

Land Development Projects -- Installations which (1) irrigate or drain an area of less than 5,000 hectares; (2) supply water to an area of less than 5,000 hectares; (3) furnish flood protection to an area of less than 5,000 hectares.

River Transport Facilities -- Locks, navigable canals, and timber-floating races on small First and Second Grade rivers.

Significance of Hydrotechnical Installations

Basic

Hydroelectric Power Plants -- Installation of which the curtailment of operation in case of repair or accident would cause a marked decrease in capacity of the power plant or its closing down, such as head and plant units and associated installations such as dams, spillways, water intakes, canals, aqueducts, siphons, tunnels, derivation pipe lines, delivery basins, regulating reservoirs, delivery pipe lines, buildings of the power plant, etc.

Land Development Projects -- Installations of which the curtailment of operations in the case of repair or accident would cause complete or partial reduction of the effective action of irrigation or draining systems, curtailment or reduction of water supply, or destruction of flood protection, such as (1) head installations: dams, locks, spillways, etc; (2) main-line canals; (3) installations regulating the expenditure of water: water dischargers, water separators, sluices; (4) connecting races; drops, cantilever chutes, etc; (5) water-delivery installations: canals, aqueducts, tunnels, races, siphons, etc.; (6) protecting dams; (7) pumping stations; (8) draining and irrigation canals, etc.

River Transport Facilities -- Sluice and canal installations of which the curtailment of operations in case of repair or accident would cause stoppage or reduction of navigation or timber floating, such as head and compartment walls of sluices, gates, water conduits, water intakes, dams, dikes, water dischargers, which are a part of a given facility; delivery installations of reservoir feeding systems; anti-accident apparatus of the facilities, etc.

Secondary

Installations on their separate parts, of which the curtailment of operation would not have the consequences indicated for the basic installations, such as for (1) hydroelectric power plants and land development projects: bulkheads and anti-ice walls, dams, auxiliary bridges not carrying the load of the gate-raising mechanisms, temporary and repair gates, canal bank reinforcements, etc; (2) for water transport facilities: sluice, dam, and canal installations, such as bulkheads, regulating apparatus, repelling and mooring devices, dams, temporary bridges, repair obstructions, canal bank reinforcements, etc.

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Auxiliary

Installations which are necessary at the time of construction or repair of basic and secondary installations, such as cofferdams, temporary outlets for excess water used in construction, construction tunnels (if they cannot be used in the future), drainage installations, scaffoldings, timber, temporary arch centers, lining, etc.

Significance and Length of Service of Installation

Grades of Installations

1st 2d 3d 4th 5th

Classes of Installations

Permanent Installations

Basic	I	II	III	IV	IV
Secondary	III	III	IV	IV	V

Temporary Installations

Basic, length of service less than 5 years	III	III	IV	IV	V
Secondary, length of service less than 5 years	IV	IV	IV	V	V
Auxiliary	IV	IV	IV	V	V

NOTE: If the length of service of auxiliary installations (cofferdams and temporary outlets for excess water used in construction excepted) does not exceed 2 years, these installations belong to Class V.

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